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09/618,645	07/18/2000	Grant R. Griffin	462-99-004	1830

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HONEYWELL INTERNATIONAL INC.
101 COLUMBIA ROAD
P O BOX 2245
MORRISTOWN, NJ 07962-2245

EXAMINER

CHANG, EDITH M

ART UNIT	PAPER NUMBER
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2634

DATE MAILED: 12/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/618,645

Applicant(s)

GRIFFIN, GRANT R.

Examiner

Edith M Chang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 July 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-42 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-42 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Objections

1. Claims 14 & 40 are objected to because of the following informalities:

Regarding claim 14, the acronym "VDL" should be spelled out, as it appears first time in the claim.

Regarding claim 40, the "Computer executable code" in the "Computer executable code according to Claim 30," lacks antecedence in this claim and its parent claims.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-2, 15-16, 29 & 41-42 are rejected under 35 U.S.C. 102(b) as being anticipated by Isaksson et al. (WO 9810548).

Regarding **claims 1 & 15**, Isaksson et al. discloses a demodulator and its methods for demodulating digital data (Fig.4), comprising: a receiver for receiving a digital data signal (Digital receiver unit Fig.4); a determining device to determine if a fractional sample delay added to a demodulator's symbol sampling timing would improve synchronization timing (Correlator, Peak position Estimator, Frame time estimate, Fig.15, Fig.14, Abstract); an

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implementing device implementing the fractional sample delay if said determining device determines that a fractional sample delay would improve the demodulation synchronization timing (Feed-back controllers, D/A Conv. Fig.15); and a demodulating device for demodulating the digital data signal (FFT Fig.4, page 37 lines 31-32).

Regarding **claims 2 & 16**, Isaksson et al. discloses the determining device comprises an algorithm that determines if a fractional sample delay would improve the demodulation synchronization timing (Fig.14, page 32 line 20-page 33 line 10).

Regarding **claim 29**, Isaksson et al. discloses a digital circuit provided for implementing the method (FIG.4-5, Fig. 14-18).

Regarding **claim 41**, Isaksson et al. discloses a method for demodulating digital data (Fig.4) comprising the steps of receiving a digital data signal (Digital receiver unit Fig.4); determining an amount of fractional sample delay to be added to a demodulator's symbol sampling timing (Correlator, Peak position Estimator, Frame time estimate, Fig.15, Fig.14, Abstract); implementing the fractional sample delay (Feed-back controllers, D/A Conv. Fig.15); and demodulating the digital data signal (FFT Fig.4, page 37 lines 31-32).

Regarding **claim 42**, Isaksson et al. discloses a demodulator for demodulating digital data, comprising: receiving means for receiving a digital data signal (Digital receiver unit Fig.4); determining means for determining an amount of a fractional sample delay to be added to a demodulator's symbol sampling timing (Correlator, Peak position Estimator, Frame time estimate, Fig.15, Fig.14, Abstract); implementing means for implementing the fractional sample delay (Feed-back controllers, D/A Conv. Fig.15); and demodulating means for demodulating the digital data signal (FFT Fig.4, page 37 lines 31-32).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 3-7 & 17-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Isaksson et al. (WO 9810548) in view of Beauvais et al. (US 4025775).

Regarding **claims 3 & 17**, Isaksson et al. does not explicitly specify using a correlation curve, however Beauvais et al. teaches exploiting the geometry of a correlation curve to determine if a fractional sample delay would improve the demodulation synchronization timing (70, 80 FIG.3, column 6 lines 16-25, FIG.5, FIG.8, column 8 lines 10-50). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the Beauvais et al.'s teaching in Isaksson et al.'s correlation position detector to achieve high accurate and sensitive correlator (column 1 lines 40-55).

Regarding **claims 4 & 18**, Isaksson et al. does not explicitly teach comparing the first and last correlation values of the correlation curve that exceed a threshold value, however Beauvais et al. teaches comparing the first and last correlation values of the correlation curve that exceed a threshold value (60, 70 FIG.3, FIG.7). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the Beauvais et al.'s teaching in Isaksson et al.'s correlation position detector to achieve high accurate and sensitive correlator (column 1 lines 40-55).

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Regarding **claims 5 & 19**, Isaksson et al. does not explicitly teach counting correlation values that exceed a threshold value, however Beauvais et al. teaches counting correlation values that exceed a threshold value (65-71-73 FIG.3, 715 FIG.7, column 8 lines 20-50, column 10 lines 1-5, where the correlation values stored). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the Beauvais et al.'s teaching in Isaksson et al.'s correlation position detector to achieve high accurate and sensitive correlator (column 1 lines 40-55).

Regarding **claims 6-7 & 20-21**, Isaksson et al. discloses determining an amount of fractional sample delay necessary to improve the demodulation synchronization timing (page 36 line 15-25).

6. Claims 8-10, & 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Isaksson et al. (WO 9810548) in view of Knutson et al. (US 5943369).

Regarding **claims 8 & 22**, Isaksson et al. does not teach the delay range, however Knutson et al. teaches the fractional sample delay is in the range of -0.5 to 0.5 (NUMERICALLY CONTROLLED DELAY FIG.2, column 2 lines 30-40, column 4 lines 50-60). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the Knutson et al.'s symbol timing recovery system in Isaksson et al.'s synchronization unit to have an efficient synchronous design (column 4 lines 58-62).

Regarding **claims 9 & 23**, inheres the limitation of claim 8 & 22 respectively, Knutson et al. teaches the fractional sample delay is in the range of -0.5 to 0.5 (NUMERICALLY CONTROLLED DELAY FIG.2, column 2 lines 30-40, column 4 lines 50-60) which includes the group consisting of $\pm 1/4$ and $\pm 1/2$. Refer to the rationale of claim 8.

Regarding **claims 10 & 24**, Isaksson et al. does not teach the interpolation filter, however Knutson et al. teaches an interpolation filter that implements the fractional sample delay (12 FIG.2, column 5 lines 2-10). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the Knutson et al.'s symbol timing recovery system in Isaksson et al.'s synchronization unit to have an efficient synchronous design (column 4 lines 58-62) to support variable symbol rate timing recovery (column 2 lines 48-52).

7. Claims 11 & 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Isaksson et al. (WO 9810548) in view of Knutson et al. (US 5943369), as applied to claims 10 and 24 above, and further in view of Beauvais et al. (US 4025775).

Regarding **claims 11 & 25**, inheres the limitation of claims 10 and 24 respectively, further Beauvais et al. teaches the steps of (i) multiplying first and second samples of each pair of input samples by respective coefficients to obtain two fractional values (FIG.1, 60, 64-65 FIG.3, column 12 lines 18-25 where the correlator provides the coefficients, column 4 lines 55-68), and (ii) summing the fractional values. (FIG.2, 19 FIG.3, FIG.7). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the Beauvais et al.'s teaching in Isaksson et al.'s synchronization unit to achieve high accurate and sensitive correlator (column 1 lines 40-55).

8. Claims 12-13, & 27-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Isaksson et al. (WO 9810548) in view of Knutson et al. (US 5943369) and Beauvais et al. (US 4025775), as applied to claims 11 and 25 above, and further in view of Broekhoven et al. (US 4894842).

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Regarding **claims 12-13, & 26-27**, further Broekhoven et al. teaches the coefficients of 0.5 to implement a fractional sample delay of half sample or 1 and 0 to implement a fractional sample delay of 0 sample (FIG.5). As the interpolation disclosed in Beauvais et al. (column 7 lines 60-68), At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the Broekhoven et al.'s teaching to detail Beauvais et al.'s interpolation of the correlation to provide a simplified receiver for a spread spectrum RF signal (column 2 lines 5-15).

9. Claims 14 & 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Isaksson et al. (WO 9810548) in view of Nishida et al. (US 6064939) and Schuchman et al. (US 5798726).

Regarding **claims 14 & 28**, Isaksson et al. does not teach the VDL Mode 2 receiver, however Nishida et al. teaches the VDL receiver in the ATN aircraft data detection device (FIG.4, column 5 line 50-column 6 line5), and Schuchman et al. teaches the sampling synchronization of the aircraft transceiver (FIG.6). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the demodulator of Isaksson et al. comprises the demodulator portion of a VDL Mode 2 receiver taught by Nishida et al. and Schuchman et al. to handle/synchronize the burst of the SACOM data.

10. Claims 30-32, & 38-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Isaksson et al. (WO 9810548) in view of Knutson et al. (US 5943369).

Regarding **claim 30**, except explicitly specify a processor, Isaksson et al. discloses all subject matter claimed (refer to the rejection of claim 1). However Knutson et al. teaches a digital signal processing system to implementing the method (column 1 lines 5-10). At the time

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of the invention, it would have been obvious to a person of ordinary skill in the art to have the DSP taught by Knutson to implement the Isaksson et al.'s method to processing digital data and provide a timing recovery in the digital implementation.

Regarding **claim 31**, except explicitly specify the computer executable code for implementing, Isaksson et al. discloses all subject matter claimed (refer to the rejection of claim 1). However Knutson et al. teaches a digital signal processing system and its method for demodulating digital data (column 1 lines 5-10). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the DSP taught by Knutson to implement the Isaksson et al.'s method to processing digital data and provide a timing recovery in the digital implementation.

Regarding **claim 32**, except explicitly specify the computer executable code for implementing, Isaksson et al. discloses all subject matter claimed (refer to the rejection of claim 2). However Knutson et al. teaches a digital signal processing system and its method for demodulating digital data (column 1 lines 5-10). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the DSP taught by Knutson to implement the Isaksson et al.'s method to processing digital data and provide a timing recovery in the digital implementation.

Regarding **claim 38**, except explicitly specify the computer executable code for implementing, Isaksson et al. discloses all subject matter claimed (refer to the rejection of claim 10). However Knutson et al. teaches a digital signal processing system and its method for demodulating digital data (column 1 lines 5-10). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the DSP taught by Knutson to implement

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the Isaksson et al.'s method to processing digital data and provide a timing recovery in the digital implementation.

Regarding **claim 39**, except explicitly specify the computer executable code for implementing, Isaksson et al. discloses all subject matter claimed (refer to the rejection of claim 11). However Knutson et al. teaches a digital signal processing system and its method for demodulating digital data (column 1 lines 5-10). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the DSP taught by Knutson to implement the Isaksson et al.'s method to processing digital data and provide a timing recovery in the digital implementation.

11. Claims 33-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Isaksson et al. (WO 9810548) in view of Beauvais et al. (US 4025775), as applied to claim 32 above, and further in view of Knutson et al. (US 5943369).

Regarding **claim 33**, further Knutson et al. teaches the executable code of a digital signal processing system and its method for demodulating digital data (column 1 lines 5-10). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the DSP taught by Knutson to implement the Isaksson et al.'s method to processing digital data and provide a timing recovery in the digital implementation (refer to the rejection of claim 3).

Regarding **claim 34**, further Knutson et al. teaches the computer executable code of a digital signal processing system and its method for demodulating digital data (column 1 lines 5-10). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the DSP taught by Knutson to implement the Isaksson et al.'s method to processing

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digital data and provide a timing recovery in the digital implementation (refer to the rejection of claim 4).

Regarding **claim 35**, further Knutson et al. teaches the computer executable code for a digital signal processing system and its method for demodulating digital data (column 1 lines 5-10). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the DSP taught by Knutson to implement the Isaksson et al.'s method to processing digital data and provide a timing recovery in the digital implementation (refer to the rejection of claim 5).

Regarding **claims 36 & 37**, further Knutson et al. teaches the computer executable a digital signal processing system and its method for demodulating digital data (column 1 lines 5-10). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the DSP taught by Knutson to implement the Isaksson et al.'s method to processing digital data and provide a timing recovery in the digital implementation (refer to the rejection of claims 6 & 7).

12. Claim 40 is rejected under 35 U.S.C. 103(a) as being unpatentable over Isaksson et al. (WO 9810548) in view of Knutson et al. (US 5943369), as applied to claim 31 above, and further in view of Broekhoven et al. (US 4894842).

Regarding **claim 40**, Further Broekhoven et al. teaches a computer readable medium provided for storing the computer executable code (42 FIG.1, column 4 lines 15-25). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the medium taught by Broekhoven et al. to store the program where the DSP equipped to handling, processing and performing the sampling direct sequence receiver (column 2 lines 5-15).

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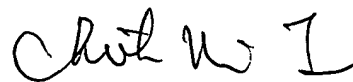
Conclusion

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edith M Chang whose telephone number is 703-305-3416. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 703-305-4714. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4800.

Edith Chang
December 6, 2003



**CHIEH M. FAN
PRIMARY EXAMINER**